



Auction House Price Prediction



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What is the Auction House?

- A faction-wide trading hub for players to buy/sell items obtained in the game
- Seller set bid & buyout prices on the item postings, and compete to have their items sold
- Buyers can choose to pay the buyout price to get the item instantly, or bid against other buyers in hopes of getting a lower price.



Predicting Price Fluctuations

- Competitive pricing leads to fluctuations in the in game “economy”
 - Similar to how the NYSE behaves
- Many different factors can affect price
 - Supply vs. Demand
 - Relevance to In-Game Content
 - Market Control from high value players



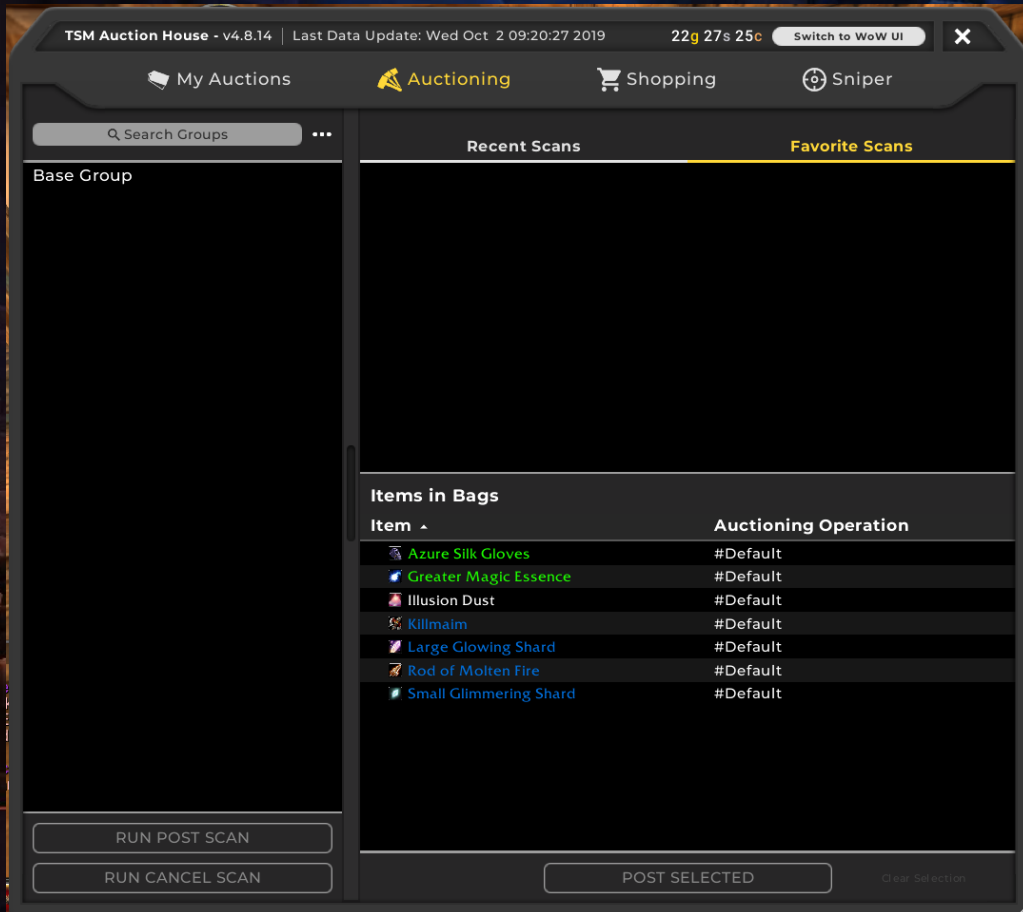
Azure Silk Gloves	
Binds when equipped	
Hands	Cloth
26 Armor	
+3 Spirit	
Durability 25 / 25	
Requires Level 24	
Equip: Increases damage done by Frost spells and effects by up to 10.	
<Made by Khadra>	
TradeSkillMaster Info	
Disenchant Value	18 02
Vendor Sell Price	8 15
Inventory	9 total
Abbington	9 (9 bags, 0 bank, 0 AH, 0 mail)
TSM Accounting	
Sold (Total Price)	9 (3 47 22)
Last Sold	1 Day 7 Hrs ago
Purchased (Total Price)	2 (46 00)
Last Purchased	6 Days 12 Hrs ago
TSM AuctionDB	
11 auctions	(36 Mins 23 Secs ago)
Min Buyout	50 98
Market Value	52 71
Region Market Value Avg	72 74
TSM Crafting	
Crafting Cost	38 12 (12 86 profit)
Small \$	

Why is this Interesting?

- Deeper understanding of in-game economies
- Find parallels with the real-world economy
- Understand what types of items have a higher volatility than others



Prior Work – TradeSkillMaster (TSM)



- TradeSkillMaster is an independent modification approved by Blizzard Entertainment used for tracking Auction House Data
- Scans the Auction House and calculates market price & minimum buyout price
- Does not store past data
- No future price prediction

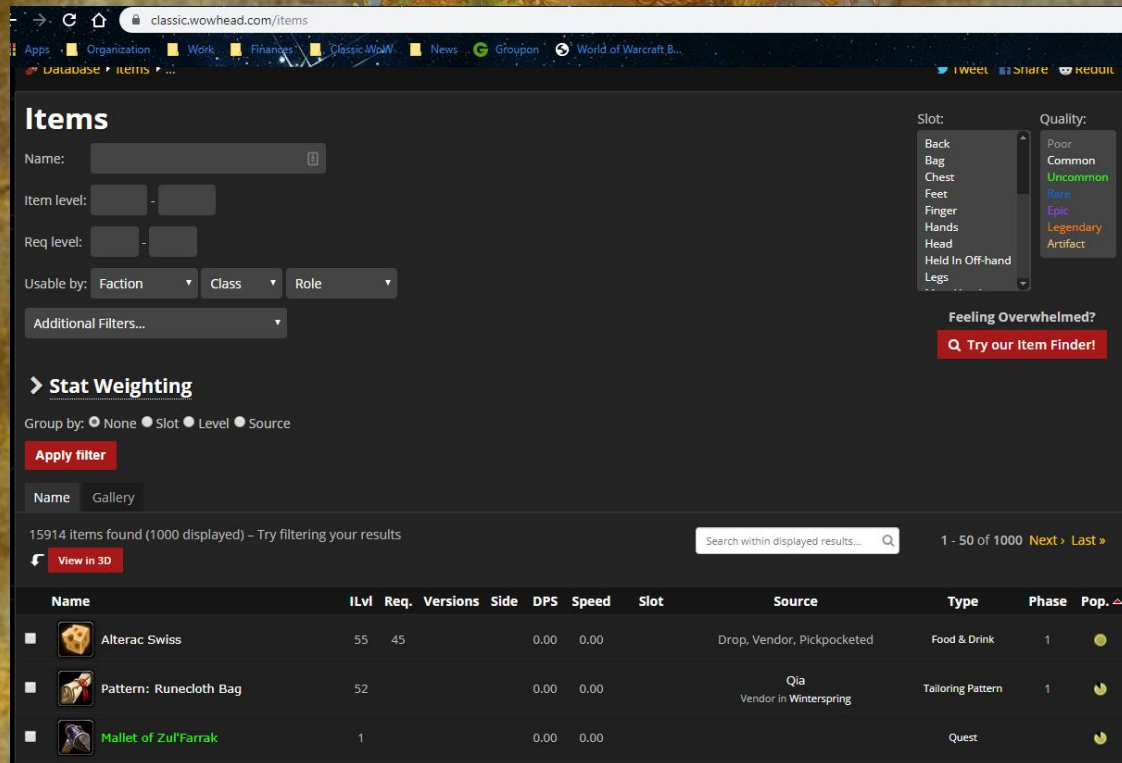
Approach & Tasks

- Develop script to automatically mine & store TSM data file every time there is an update
 - Store in SQL DB or CSV file
- Mine WoWhead DB (Using Web Scraping) to collect all data on all items
- Develop Python Dash App to visualize data in real-time
- Use Machine Learning to predict future price fluctuations



```
AppData.lua
1 select(2, ...).LoadData("AUCTIONDB_MARKET_DATA","Grobbulus-Alliance",[[return {down
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```


Obtaining the Data & Challenges



classicwowhead.com/items

Items

Name:

Item level: -

Req level: -

Usable by: Faction Class Role

Additional Filters...

Stat Weighting

Group by: ☐ None ☐ Slot ☐ Level ☐ Source

Apply filter

Name Gallery

15914 Items found (1000 displayed) - Try filtering your results

Search within displayed results...

1 - 50 of 1000 Next > Last >

Name	ILvl	Req	Versions	Side	DPS	Speed	Slot	Source	Type	Phase	Pop.
Alterac Swiss	55	45			0.00	0.00		Drop, Vendor, Pickpocketed	Food & Drink	1	
Pattern: Runecloth Bag	52				0.00	0.00		Qia Vendor in Winterspring	Tailoring Pattern	1	
Mallet of Zul'Farrak	1				0.00	0.00			Quest		

- Blizzard does not have a public API
- TSM relies on player scans of AH
- Need to collect data from TSM LUA data folders manually (Can use an automated script on a server)
- For static data (item stats, Non-player character price), need to web scrape WoWHead.com

Evaluation

- I am going to evaluate my work by how well my strategy performs with the WoW Economy
- TSM keeps a log of portfolio performance dating back to 1 year
- The rate of growth of my portfolio determines how effective my strategy is.



Timeline

1. Complete TSM data mining script and have it up and running on a server – Oct 15
2. Mine all WoW Classic Item Data from WoWHead – Oct 31
3. Collect 1 month's worth of TSM data (~480 scans) – Nov 15
4. Deploy Dash App (Privately) – Nov 30
5. *Tentative* – Build Machine Learning Algorithm to Predict Future Pricing – Dec 10